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ABSTRACT

Three facets of literacy measurement were examined in this study: the assessment of functional literacy with an instrument designed to reflect practical reading tasks; the effect of mode of test administration on literacy; and the relationship of literacy to sex, schooling, and traditional measures of reading. Subjects were 626 young adults enrolled in four Job Corps residential centers. R/EAL (Reading/Everyday Activities in Life), a new test of functional literacy, was administered to subjects under one of three conditions: English-taped, English-printed, or Spanish-taped. Results indicated that under each of the conditions, R/EAL proved to be a reliable and valid measure of literacy. Significant relationships were found between literacy performance and number of years of school completed and between literacy and traditional reading for each condition. No significant relationships were found between sex or length of stay in program and literacy. Conclusions are that literacy measurement on practical reading tasks can be accomplished, that test administration conditions do not significantly affect test performance for groups at comparable reading levels, and that a number of factors appear to be associated with such measurement. (Author/TO)

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New Methods and Interpretations of the Assessment of Literacy Among Young Adults*

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Abstract

Three facets of literacy measurement were examined in this study: the assessment of functional literacy with an instrument designed to reflect practical reading tasks; the effect of mode of test administration on literacy; and the relationship of literacy to sex, schooling, and traditional measures of reading. Subjects included 626 young adults enrolled in four Job Corps residential centers. Job Corps is a federally supported program designed to teach 16-21 year old disadvantaged youth basic reading and math skills, job-oriented skills, and social living. R/EAL, a new test of functional literacy, was administered to subjects under one of three conditions: English-taped, English-printed or Spanish-taped. Data on years in school, time in program, and traditional reading measures were obtained from existing records. Results indicated that under each of the three conditions, R/EAL proved to be a reliable and valid measure of literacy. Anova by form of administration indicated significant differences between English and Spanish taped formats but none between English taped and printed conditions. However, these differences appeared to be due more to initial differences in reading rather than form of administration. Significant relationships were found between literacy performance and number of years of school completed, and between literacy and traditional reading for each condition; yet there were no significant relationships between sex or length of stay in program and literacy. Conclusions are that literacy measurement on practical reading tasks can be accomplished, that test administration conditions do not significantly affect test performance for groups at comparable reading levels, and that a number of factors appear to be associated with such measurement.

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Increasing public pressure for educational accountability has led to new definitions and increased assessment of reading throughout the United States. Harris' surveys (1970, 1971) explored the extent of the literacy problem on the national scene. In surveying the ability of adults to perform such reading tasks as locating information in a telephone directory and completing a medicare form, Harris determined that as many as 18 ½ million Americans are functionally illiterate (1970, p. 7). Illiteracy rates broken out by sex, race, geographic location and other variables led Harris to observe that "despite this sharp difference in results /Blacks scoring considerably lower than whites/, we do not feel that race alone is a meaningful indicator of reading ability" (1971, p. 54). Rather, he suggested that race is closely correlated with educational background. In his sample three times as many Blacks stopped their education at 8th grade or earlier. Further, Harris concluded that income level also was an indicator of reading abillty. And in examining age, Harris noted "Since functional reading ability is closely linked with practical experience in real-life situations, it seems reaconable that 16-year-olds scored lower than others interviewed" (1971, p. 57). Difficulties among those over 50 were also noted. These two surveys suggest the pervasive and widespread nature of the problem. More importantly, they offer new interpretations of reading and literacy, i.e., that it be concerned with applications of reading to practical material.

A full scale determination of the reading habits of adult Americans and the subsequent development of adult tasks suitable for the assessment of literacy have been undertaken by Educational Testing Service (Jackson, 1972 and Sharon, 1972). Sharon's report details the kinds of materials adults read. 5,067 adults representing a cross-

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section of the population were queried regarding their reading habits. A summary of their responses provides empirical support for the hypothesis that adults tend to spend about one and three quarters hours per day reading newspapers, magazines, books, and job-related materials (Sharon, p. 16). Newspapers are read more frequently than any other material. Jackson's work considers the development of adult tasks for literacy assessment. Detailed information on the nature of this project has not been made available, however.

Somewhat related to the development of adult tasks for literacy assessment as proposed by Educational Testing Service is the work conducted by Sticht, Caylor and others (Sticht & Kern, 1970; Sticht, Caylor, Kern & Fox, 1971; and Sticht & Caylor, 1972). In a study conducted for the Army, Sticht and Caylor explored "how well a person needs to read to perform selected adult reading tasks..." (1972, p. 29). In their view, reading was often job related and literacy should be defined in terms of the reading demands imposed by the job. Reading tasks were developed for specific jobs such as cook and repairman. In examining the relationship between performance on the Job Reading Task Tests and scores on a standardized reading test and the Armed Forces Qualifying Test, they noted that "to a large extent these three instruments appear to be measuring similar skills" (1972, p. 42). However, it was found that Job Reading Task Tests were more suitable in measuring ability to perform job related reading tasks. They concluded that literacy demands of the job should be considered in the development of adult basic education objectives and related assessment procedures.

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Building on the premise that assessment of reading should be task oriented, the National Assessment of Educational Progress developed series of tasks based on reading objectives which were used to assess reading performance of students at various age levels. A large number of tasks were developed covering eight general categories (National Assessment, 1972a). Tasks were administered to samples of students at four age levels and performance based on median percentage of a group passing a given section was reported. Differences associated with sex, race, parental education, geographic region, and size and type of community were computed (National Assessment, 1972b). A recent National Assessment study supported by the Office of Education will determine literacy levels among 5200 17-year-olds attending school. This assessment utilizes exercises "based on practical reading material--advertisements, labels, television program schedules" (Report on Education Research, 1973, p. 3 and Wilson, 1973). In a somewhat related effort, Hansen and Hesse (1974) have been attacking the assessment of literacy by utilizing cloze passages representing cross sections of ten content domains of reading material including consumer, safety and occupational areas.

The direction of current research lends support to the position that assessment of reading and functional literacy should focus on practical reading material reflective of adult reading habits, job related skills, or educational objectives. Tied in with the practicality aspect is the need for the individual to demonstrate his ability to apply reading skills to concrete reading tasks. Meaningful and practical interpretation of reading performance can better be achieved if the test items are directly related to predetermined tasks and objectives of literacy or to job related tasks (Sticht and Caylor, 1972).

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Other considerations related to reading or literacy test performance have also surfaced. One area of interest is the differential effect of test format on the test performance of individuals who have experienced extreme difficulties in reading. For some time efforts have been directed at identifying optimum test administration conditions especially for pupils of low socio-economic status with low reading achievement (Bennett & Doppelt, 1968; Ferris & Nichols, 1967, 1968; Ferris et al, 1968; and Larsen & Rogers, 1968). Ferris and Nichols (1969) explored the test performance of third and seventh grade students under four conditions including individual interview, individual self-paced tape, individual speaker-paced tape, and group speaker-paced tape. To their surprise, the data analysis revealed that for certain types of performance the individual interview and group speaker-paced proved significantly higher than the other two conditions. Hollenbeck and Micucci's work (1974) exploring effects of oral or written test format on test performance of black and white women found no significant effect due to test format; likewise Hopkins et al (1967) found no effect of test administration format (television v. teacher) on the performance of fifth and sixth grade students. Further, Remer (1974) reported no difference in test performance due to test modality (videotape, audiotape, and transcript). Lovins (1973) varied test administration format by establishing two conditions for the administration of an arithmetic test to sixth grade black children. Using either a perfunctory, minimal, concise instructional set or one with an atmosphere of kindness and empathy, Lovins found no significant differences due to test condition. Yet in spite of the conclusions one might reach from the above research, Ferris and Nichols, in interpreting their study suggested that "[f]or some reason,

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perhaps novelty, response mode, isolation from classroom, individual testing in the van by self- and speaker-paced tape recordings elicited poorer test performance [than in the other conditions]..." (1969, p.90). Further, although some of the studies dealt with poor readers and those of low socio-economic status, none was specifically aimed at the young adult whose accumulated failure in test taking situations may make the mode of test presentation an even greater factor affecting his test performance.

Davis and Personke (1968) examined test performance as a function of test administration in English or Spanish. Using a sample of eighty-eight Spanish speaking young children, they found no difference in performance on the Metropolitan Readiness Test due to language in which the test was administered. However, they suggested caution in broad interpretations of this finding. Zintz (1970), in a consideration of reading instruction, suggested that students will be able to read and write English better if first given an opportunity to speak it. An inability to speak English fluently may also have an effect on the student's ability to process information presented orally in English. It may be that oral presentation in the native language may facilitate test performance.

In addition to factors directly connected with the content, format and administration of a test, other factors not directly associated with the test per se may be related to literacy test performance. One such factor specifically explored in this study is male-female differences. Although studies examining male-female difference in reading performance have found generally that females achieve at higher levels than males,

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Uroff (1972) found that high school males made significantly greater gains than females on a measure of reading achievement growth and Long (1972) found that male high school students achieved higher than females in the math area. An apparent conflict in the literature suggests further investigation of the possible relationship between literacy performance and sex.

Finally, certain aspects of the effects of schooling, whether number of years of school completed or amount of time in present school situation, on literacy achievement warrant additional exploration. Stauffer (1973), in his extensive descriptive study of 96 adult literacy programs in 29 states, noted a positive relationship between number of years of formal schooling and reading gains, except in the case of white students. He also found positive relationships between length and duration of reading class and reading gains.

Concerns of the present study center on three aspects of the literacy assessment problem: the assessment of functional literacy with a reliable and valid instrument designed to reflect practical reading tasks; the examination of the effect of mode of test administration on literacy performance; and the exploration of the relationship of literacy performance to sex, schooling, and traditional measures of reading performance.

Method

Sample

The subjects in this study consisted of 626 Job Corps enrollees (339 females and 287 males), who were full time students in the program

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Job Corps is a federally supported program designed to teach 16-21 year old disadvantaged youth basic reading and math skills, job-oriented skills, and social living. Students were selected from one of four Job Corps Centers located in New Jersey, New Mexico, Texas, and West Virginia. For the most part students were Black and Mexican-American. A minority of students was white. Sample selection varied from Center to Center due to conditions prevailing at the individual Centers; however, in most cases students were selected randomly.

Procedures

Literacy performance was determined by R/EAL, a 45-item criterion-referenced test consisting of nine reading selections, including road signs, want ads, a lease, an application form and other reading materials selected to represent common reading activities (Lichtman, 1972, and 1974, in press). Detailed reading objectives and task analyses for each reading selection provide the user with concrete information about the reading tasks involved. An objective scoring key facilitates evaluation of responses. R/EAL yields a mastery level score which is defined as passing 80 percent or more of the items, such mastery being indicative of functional literacy.

Standardized reading achievement measures included the Stanford Achievement Test (Kelley, et al., 1964), various forms and levels, and the RJS1 Test, a 25-item screening instrument consisting of graded paragraphs with selected words deleted. Student selects the correct response from a set of alternatives. This test, specifically developed for Job Corps, is used as an aid in placement of students and in determining suitable levels of the Stanford to administer.

In order to explore the effect of test administration format on literacy performance, R/EAL was administered under one of three conditions: Standard English taped, Standard English printed, and Spanish taped. Under

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the first and third conditions each student was tested using an individually operated and controlled audio cassette player with all directions and questions in English or Spanish. Under the second condition each student received all directions and questions in Standard English printed directly in the R/EAL test booklet. For each of the three conditions all material which the subject actually read was displayed in English in the R/EAL test booklet. All responses were made in writing (English or Spanish) directly in the test booklet.

In Centers where no Spanish-speaking students were present, subjects were assigned to the first two conditions randomly. However, due to other requirements of the study many more students were tested under the first testing procedure. In Centers where Spanish-speaking students were present, subjects who were monolingual Spanish or bilingual were assigned to the third condition. Although no precise figures were available, about half of the subjects receiving the third condition were bilingual.

The study was conducted on site in four geographic locations by the author and members of the project staff during November and December 1972. All data on related variables, including Stanford Achievement Test and RJS1 Test scores were collected during the on site visits from existing student records.

Results

Three aspects of literacy assessment were considered in this study: determination of literacy levels of subjects; effect of test mode on literacy performance; and the examination of literacy performance as

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relates to selected variables. For each of three reading tests, means and standard deviations are reported separately for each form of administration and for the total group in Table 1. Also included in

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Insert Table 1 about here

Table 1 are reliability data for R/EAL.

In order to assess the effect of form of test administration on literacy performance, a one-way analysis of variance was performed using form of administration as the main effect. Post hoc comparisons utilizing a Scheffé test (Hays, 1973) were also computed. Table 2

Insert Table 2 about here

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indicates an F significant beyond the .01 level. Scheffé post hoc comparisons showed significant differences between the Standard English taped mean and the Spanish taped mean, but no other significant comparison.

The relationship of literacy performance to selected variables was examined separately for each of the three forms of test administration. These intercorrelations are reported in Table 3.

Insert Table 3 about here

Discussion

The determination of literacy utilizing a test designed to measure practical, functional reading skills in real life situations was examined in terms of test reliability and validity. Reliability for the test is at or above .90 for each of

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the three conditions as reported in Table 1. Treating the relationship between R/EAL and the Stanford Achievement Test as a type of concurrent validity, correlations of .74 for the English taped version and .61 for the Spanish taped version (Table 3), as well as the somewhat lower but significant correlation for the English printed version, suggest that to a considerable extent R/EAL and the Stanford have considerable overlapping variance and measure many of the same reading skills.

An appraisal of the extent of literacy in the target population is also of interest in this study. More meaningful than the raw score means and standard deviations is the percentage of subjects in each group that were at or above mastery level, previously defined as passing at least 80 percent of the items. Although the percentage figures vary depending on the form of administration, the data reveal that in no case did more than approximately 25 percent of any group demonstrate mastery of functional reading skills. A number of explanations for such a small percentage might be offered, but additional examination of program variables would need to be conducted to verify explanations. One possible explanatory factor may be that those who had already mastered functional literacy had left the program and that those students still served by the program were those who continued to have a need and thus would not test at mastery level. On the other hand, it might be that programs, servicing diverse and perhaps conflicting constituents and goals, were not accomplishing the goal of mastery of basic literacy skills for its population. A somewhat less extreme explanation would take into account possible intervening variables which may inhibit program effectiveness towards achieving literacy. In any event, continued study looking at more specific aspects of the program

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is recommended.

Turning next to a consideration of the effect of mode of test presentation on literacy performance, the Anova in Table 2 and the subsequent Scheffé comparisons reveal significant differences between English taped and Spanish taped modes, but no other significant differences. However, a closer examination of data relating to entry level reading skills (RJS1) and current reading skills (Stanford) of the three groups (Table 1) suggests a marked difference in reading skills of the English and Spanish groups. The explanation that differences in literacy performance were due to initial reading differences and language interference rather than to mode of testing is more compelling. It is suggested that additional studies be conducted with bilingual groups and under more controlled conditions in order to investigate this question. Although Davis and Personke (1968) found no differences among young children, possible language interference affecting information processing among low reading achievement subjects continues to warrant additional investigation.

The lack of significant differences between the taped and printed English is also revealing. Even though earlier studies had not found differences due to test modality, it was hypothesized that the non-test like atmosphere and more motivating format of the taped condition, as well as the elimination of processing of directions and questions via the printed word, would result in better performance by those subjects presented with this mode. Yet the finding of no significant difference did not substantiate this hypothesis. This finding adds additional support to the lack of significance of test modality on test performance of Ferris and

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Nichols (1968) and Remer (1974). On the other hand, on site observations of subjects taking both forms and candid comments by students and teachers reflect greater interest and enthusiasm for taking a test which, on the face of it , does not appear to be a test. The lack of significant results, however, does not lead to the abandonment of the investigation of alternative test administration modalities for low achieving young adults; rather it leads to continued examination of factors which may optimize testing procedures and conditions among adult populations.

Finally a consideration of the results of the study leads to an analysis and interpretation of the relationship of selected variables and literacy performance. These analyses were computed separately for each of the three testing conditions. Looking at the data in Table 3, one is impressed first with the fact that the number of years a student has spent in school prior to entrance in the Job Corps program is, in all cases except one, significantly and positively related to performance on literacy measurements (R/EAL), to performance on current measures of reading (Stanford Achievement Test), and to initial performance on reading measures (RJS1). These correlations, consistent with data reported by Stauffer (1973), suggest that the more time a student has spent in school prior to entrance into a program, the more he will achieve in reading. This finding holds constant for the three separate groups. The consistency of the finding takes on additional meaning when mean number of years of school completed under the English conditions (audio or printed) is compared with that of the group receiving the Spanish tape. Although the former groups had completed an average of nine years of school and

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the latter group less than seven and a half, the positive relationship of years of school completed and reading performance is still confirmed. Consistent with these findings is the negative relationship (in one case significant) between the number of years of school completed and the length a student stays in the program. Precise reasons for this negative relationship are unclear, but possible explanatory factors might be less need for the program because of higher entry level ability, better chance of program success in shorter time period, or lack of congruence between program goals and student needs. Whether or not the students who had completed more school remained in the program a shorter time because their needs were not as great, their goals were accomplished faster, or their needs remained unmet must be explored more fully in subsequent studies.

Another characteristic examined in the study was the relationship of sex of the student to other variables. Correlations of the student's sex to literacy performance revealed no significant correlations in any of the three comparisons. Although not significant, the data suggest a negative correlation between literacy and males for the English printed condition; conversely, the relationship was reversed for the Spanish taped condition in which being female was positively related to literacy. In the largest number of cases, though, no relationship occurred. The inconclusive evidence presented here substantiates the conflicting evidence reported earlier.

Also explored in this study was the student's reading performance at the time of program entry and its relationship to literacy. In all cases,

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there was a significant positive relationship between entry level reading performance (RJS1) and subsequent measures of reading and literacy. This not unanticipated finding suggests that performace in reading and literacy tasks at one time period is closely associated with measured reading ability at an earlier point in time.

Contrary to Stauffer's finding about the relationship of program duration to success was the negative, but not significant, relationship between reading performance and the length a student remains in the program. At least three possible explanations for this lack of relationship may be offered: program goals were not directed at functional literacy and thus it would not be expected that those who remained in a program longer would achieve greater literacy; program goals were directed at functional literacy but were not successful;or program goals were directed at functional literacy but the measure used to assess literacy was unable to detect differences. Further since those students who initially were highest in reading ability stayed a shorter length of time than those who were lower, it may be that length of time in the program is an irrelevant variable in explaning literacy achievement.

As a whole it would appear that certain student characteristics, in particular the number of years of school completed and initial reading performance, are positively related to subsequent performance on reading and literacy tasks. Due to the limited population under study, it was not possible to explore additional student characteristics, such as various home and family background variables which have be a suggested as influencing reading performance (Coleman, 1966; Mayes[illegible],n.d.). Subsequent studies with similar populations may shed additional light on explanatory variables.

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Summary

This research has examined literacy assessment from two perspectives: the effect of test administration format on literacy performance and the association of literacy performance with selected characteristics of students and programs. The most salient findings revealed significant differences between Spanish-taped and English-taped administration procedures. However, as suggested, this difference is apparently due more to different characteristics of the samples (e.g. entry level reading, and years of school completed) than to form of administration. To further confirm this supposition an additional study with more comparable groups should be undertaken. Other important findings reveal significant positive relationships between literacy performance and number of years of school completed, entry level reading behavior, and current reading behavior. Moreover, no significant relationships between sex or length of stay in the program and literacy were observed. This study serves only as a beginning in explorations of literacy assessment through new techniques. Currently studies assessing factors related to growth in literacy as measured by R/EAL are being conducted. A large study presently in progress identifies and measures large numbers of student and program variables and their relationship to literacy growth.

Table 1

Means, Standard Deviations and Reliability:

Three Reading and Literacy Measures

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Form of Administration	n	R/EAL $\bar{x}$	R/EAL s.d.	R/EAL K-R20[a]	RJS1[b] $\bar{x}$	RJS1[b] s.d.	Stanford[b] $\bar{x}$	Stanford[b] s.d.
English - taped	434	28.02	10.41	.93	13.36	6.27	5.29	2.36
English - printed	90	27.04	9.54	.92	12.26	7.50	4.36	2.61
Spanish - taped	102	23.65	9.07	.90	4.10	5.89	2.74	1.97
Total	626	27.17	10.17		11.68	7.25	4.74	2.49

a Kuder - Richardson 20 computed separately for each form

b Test information obtained from existing records. No reliability data available.

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Table 2

Analysis of Variance

by Form of Administration

Source	df	MS	F
Between groups	2	791.24	7.79*
Within	622	101.62	

*$p < .01$

TABLE 3

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Intercorrelations of Selected Variables

by Form of Administration

1. English - Taped

	1. Sex	2. Years School	3. RJS1	4. Length Program	5. Stanford	6. R/EAL
1.	---	.24*	-.04	-.13	.08	.02
2.		---	.25*	-.23*	.28*	.28*
3.			---	-.14	.70*	.65*
4.				---	-.03	.07
5.					---	.74*
6.						---

2. English - Printed

	1.	2.	3.	4.	5.	6.
1.	---	.30	.09	-.18	.15	-.18
2.		---	.37**	-.24	.42*	.25
3.			---	-.32	.44*	.51*
4.				---	.15	-.18
5.					---	.35**
6.						---

3. Spanish - Taped

	1.	2.	3.	4.	5.	6.
1.	---	.22	.06	.23	.14	.20
2.		---	.38*	-.10	.41*	.39*
3.			---	-.24	.67*	.46*
4.				---	.19	.06
5.					---	.61*
6.						---

* Sig. beyond .01 level
** Sig. beyond .05 level

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